

09/927,625 (QUA-103)

12/9/2004

LISTING OF CLAIMS

The following listing of claims replaces all prior versions or listings of claims pending in the application:

- 5 1. (original) A data-flow and context-flow data processing system comprising a plurality of data driven cores capable of switching between a plurality of contexts, wherein the plurality of data driven cores comprises a plurality of distributed multi-context storage units each capable of storing a plurality of context parameters corresponding to the plurality of contexts, each multi-context storage unit comprising:
- 10 a) a context register bank comprising
 a plurality of context parameter registers for storing the plurality of context parameters, each context parameter register storing a parameter for one of the contexts, the plurality of context parameter registers having a corresponding plurality of inputs connected to an input connection, and
15 a corresponding plurality of outputs; and
 a multiplexer having a plurality of multiplexer inputs each connected to a corresponding one of the plurality of context parameter register outputs, for selecting a current context parameter set for transmission to a multiplexer output;
- 20 b) a context identification register connected to the context register bank, for storing a current context identification token identifying a current context for the context register bank, wherein
 the context identification register is connected to a select line of the multiplexer, for controlling the multiplexer to select the current context
25 parameter set for transmission; and
 the context identification register is connected to a load enable line of each of the context parameter registers, for enabling an updating of a current context parameter set in a corresponding context parameter register;
 and
- 30 c) logic connected to the multiplexer output for receiving the current context parameter set and processing a set of data tokens according to the current context parameter set, connected to the input connection of the context parameter registers for providing updated context parameter sets to the context parameter registers, and connected to the context identification register for

09/927,625 (QUA-103)

12/9/2004

propagating the current context identification token through the multi-context storage unit.

- 5 2. (original) The system of claim 1, further comprising logic for controlling a flow of the set of data tokens through the cores such that each data token is transferred from a first core to a second core upon a synchronous assertion of a request signal from the second core to the first core, and of a ready signal from the first core to the second core.
- 10 3. (original) The system of claim 1, wherein an interface of a core includes a content specification flag for indicating whether a token containing the flag is a data token or a context identification token.
- 15 4. (original) The system of claim 1, wherein an interface of a core includes a dedicated context identification field for transferring a current context identification token with each data token passing through the interface.
- 20 5. (currently amended) A ~~data-flow and~~ context-flow data processing system, comprising a plurality of ~~data-driven~~ cores including:
- a) logic for controlling a flow of ~~data-tokens and~~ context identification tokens through the cores;
- b) a plurality of distributed multi-context storage units, each multi-context storage unit including:
- 25 a context identification register for storing a context identification token identifying a current context of said each multi-context storage unit; and
- a multi-context register bank for storing a plurality of context parameters corresponding to a plurality of contexts,
- wherein the context identification register is connected to the multi-context register bank for setting the multi-context register bank to the current context; and
- 30 c) logic for processing ~~the data-tokens~~ data according to a context parameter corresponding to the current context.

09/927,625 (QUA-103)

12/9/2004

6. (currently amended) A ~~data-flow and context-flow data processing system, comprising system comprising a plurality of data-driven cores~~, each of the cores including:

- a) a context identification storage unit for storing a current context identification token, the current context identification token identifying a current context state selected from a plurality of context states stored in said each of the cores;
and
b) logic for controlling a flow of the current context identification token through the cores such that the current context identification token is transferred from a first core to a second core upon a synchronous assertion of a request signal from the second core to the first core, and of a ready signal from the first core to the second core.

7. (currently amended) A ~~data and context-flow~~ processing method comprising the steps of:

- a) propagating a current context identification token through a plurality of ~~data flow-cores~~ integrated on a chip, the current context identification token identifying a current context;
b) retrieving a set of context parameters corresponding to the current context from each of a plurality of multi-context storage units distributed through the cores, as the current context identification token propagates through the multi-context storage units; and
c) processing a set of data tokens in the current context, according to the set of context parameters.

8. (currently amended) A ~~data and context-flow data processing system comprising a first data and context-flow core and a second data and context-flow core integrated on a chip~~, the first core comprising:

- a) an input interface for receiving a ~~data token and a context identification token from the second core~~, the context identification token identifying one of a plurality of contexts as a current context, ~~wherein each token transfer between the second core and the first core occurs upon a synchronous assertion of a request signal from the first core to the second core and a ready signal from the second core to the first core;~~

09/927,625 (QUA-103)

12/9/2004

- 5
- b) a context identification register connected to the input interface, for storing the context identification token;
 - c) a multi-context storage unit connected to the context identification register, for storing a plurality of context parameters corresponding to the plurality of contexts;
 - d) control and processing logic connected to the context identification register and the context register bank, for processing data according to a set of context parameters for the current context.
- 10 9. (currently amended) A ~~data and context-flow~~ data processing system comprising a plurality of cores, each of the cores comprising:
- a) an input control bus for transferring input control signals;
 - b) an input token bus for receiving input tokens in response to assertions of the input control signals, the input tokens including
 - 15 an input data token to be processed by the core, and
 - an input context identification token for specifying a current context, the input context identification token identifying a current context state selected from a plurality of context states stored in said each of the cores;
 - c) an output control bus for transferring output control signals; and
 - d) an output token bus for sending output tokens in response to assertions of the output control signals, the output tokens including
 - 20 an output data token derived from the input data token, and
 - an output context identification token equal to the input context identification token, for specifying the current context.
- 25
10. (currently amended) A multithreaded data processing system comprising a first ~~data-driven~~ core, a second ~~data-driven~~ core, and a third ~~data-driven~~ core integrated on a chip, the first core comprising:
- a multi-context storage unit storing a plurality of context states for a corresponding plurality of contexts;
 - a) ~~a first input interface connected to the second core, comprising~~
 - 30 a first input request connection for asserting a first input request signal to the second core,

09/927,625 (QUA-103)

12/9/2004

- a first input ready connection for receiving a first input ready signal asserted by the second core, and
- a first input data connection for receiving from the second core an input a first input context token for establishing a current context state for the first core, the current context state being selected from the plurality of context states;
- b) — processing logic connected to the first input interface and to the multi-context storage unit, for processing a data token according to the current context state;
- e) — a first output interface connected to the third core, comprising
- a first output request connection for receiving a first output request signal asserted by the third core,
- a first output ready connection for asserting a first output ready signal to the third core, and
- a first output data connection connected to the processing logic, for transmitting to the third core a first output context token derived from the first input context token, for establishing the context state for the third core;
- d) — first input control logic connected to the first input interface, for controlling the first core to receive the first input context token if the first input request signal and the first input ready signal are asserted with a predetermined synchronous relationship; and
- e) — first output control logic connected to the first output interface, for controlling the first core to transmit the first output context token to the third core if the first output request signal and the first output ready signal are asserted with a predetermined synchronous relationship.
11. (original) The system of claim 10 wherein:
- a) the first input control logic comprises logic for controlling the first core to receive the first input context token if the first input request signal and the first input ready signal are asserted synchronously; and
- b) the first output control logic comprises logic for controlling the first core to transmit the first output context token to the third core if the first output request signal and the first output ready signal are asserted synchronously.

09/927,625 (QUA-103)

12/9/2004

12. (original) The system of claim 11 wherein:

- a) the first input control logic comprises logic for controlling the first core to receive the first input context token synchronously with the first input request signal and the input ready signal; and
- b) the first output control logic comprises logic for controlling the first core to transmit the first output context token synchronously with the first output request signal and the output ready signal.

13. (currently amended) The system of claim 10 wherein:

- a) the first core further comprises a second output interface connected to a fourth core integrated on the chip, the second output interface comprising a second output request connection for receiving a second output request signal asserted by the fourth core, a second output ready connection for asserting a second output ready signal to the fourth core, and a second output data connection connected to the data processing logic, for transmitting the first output context token to the fourth core; and
- b) the first core further comprises second output control logic connected to the second output interface, for controlling the first core to transmit the first output context token to the fourth core if the second output request signal and the second output ready signal are asserted synchronously.

14. canceled.

15. (currently amended) The system of ~~claim 14~~ claim 10 wherein the multi-context storage unit comprises:

- a) a plurality of registers connected in parallel, for storing a plurality of context parameter values for a corresponding plurality of contexts; and
- b) a multiplexer connected to the outputs of the plurality of registers, for selecting for transmission a value of the context parameter corresponding to a current context state for the multi-context storage unit.

09/27,625 (QUA-103)

12/9/2004

16. (currently amended) A multithreaded data processing system comprising a first ~~data-driven~~ core and a second ~~data-driven~~ core, the first core comprising an input interface connected to the second core, the input interface including:
- 5 a) an input request connection for asserting an input request signal to the second core;
- b) an input ready connection for receiving an input ready signal asserted by the second core; and
- c) an input data connection for receiving from the second core, ~~upon a synchronous assertion of the input request signal and the input ready signal, a~~
10 first an input context identification token identifying a current context state selected from a plurality of context states stored in the first core.
17. (currently amended) A multithreaded data processing system comprising a first ~~data-driven~~ core, a second ~~data-driven~~ core, and a third ~~data-driven~~ core integrated on a chip, the first core comprising:
- 15 a) an input interface connected to the second core, comprising
 a control bus for transmitting a set of first control signals between the first core and the second core, and
 an input data bus for receiving from the second core, upon the assertion of the
20 set of first control signals according to a predetermined protocol
 an input data token, and
 an input context identification token for establishing a current context state in the first core, the current context state being selected from a plurality of context states stored in the first core;
- 25 b) processing logic connected to the ~~first~~ input interface, for generating an output data token from the input data token according to the current context state; and
- c) an output interface connected to the third core, comprising
 an output control bus for transmitting a set of second control signals between
 the first core and the third core, and
30 an output data bus connected to the processing logic, for transmitting to the third core, upon the assertion of the set of first control signals according to the predetermined protocol
 the ~~first~~ output data token, and

09/927,625 (QUA-103)

12/9/2004

~~a first~~ an output context identification token derived from the first input context identification token, for establishing the current context state in the third core.

- 5 18. (currently amended) A ~~data and~~ context-flow data processing method comprising the steps of:
- 10 a) establishing a first ~~data and context driven~~ core and a second ~~data and context driven~~ core, the second core being connected to the first core for receiving data tokens and context identification tokens from the first core, each context identification token identifying a context state selected from a plurality of context states stored in the second core cores; and
- b) operating the first core in a first context, and concurrently, operating the second core in a second context different from the first context.
- 15 19. (original) A ~~data and~~ context-flow processing method comprising the steps of:
- a) establishing a ~~data and context driven~~ core comprising a plurality of interconnected pipestages, the pipestages including logic for controlling a flow of data tokens and context identification tokens therethrough, and
- 20 a plurality of distributed multi-context storage units each storing a plurality of context parameters and each responsive to the context identification tokens; and
- b) operating a first set of pipestages in a first context specified by a first context identification token present within the first set of pipestages, and concurrently,
- 25 operating a second set of pipestages in a second context specified by a second context identification token present within the second set of pipestages.
20. (new) The data processing system of claim 5, wherein each of the plurality of cores is a data-driven core.
- 30 21. (new) The data processing system of claim 6, wherein each of the plurality of cores is a data-driven core.

09/927,625 (QUA-103)

12/9/2004

22. (new) The data processing method of claim 7, wherein each of the plurality of cores is a data-driven core.
23. (new) The data processing system of claim 8, wherein the first core and the second core are data-driven cores.
24. (new) The data processing system of claim 8, wherein each token transfer between the second core and the first core occurs upon a synchronous assertion of a request signal from the first core to the second core and a ready signal from second core to the first core.
25. (new) The data processing system of claim 10, wherein the first core, second core and third core are data-driven cores.
26. (new) The data processing system of claim 16, wherein the first core and the second core are data-driven cores.
27. (new) The data processing system of claim 17, wherein the first core, second core and third core are data-driven cores.
28. (new) The data processing method of claim 18, wherein the first core and the second core are data-driven cores.
29. (new) The data processing method of claim 19, wherein the core is a data-driven core.
30. (new) A multi-context storage unit for storing a plurality of context parameters corresponding to a plurality of contexts, the multi-context storage unit comprising:
a context register bank comprising
a plurality of context parameter registers for storing the plurality of context parameters, each context parameter register storing a parameter for one of the contexts, the plurality of context parameter registers having a corresponding plurality of inputs connected to an input connection, and a corresponding plurality of outputs; and

09/927,625 (QUA-103)

12/9/2004

a multiplexer having a plurality of multiplexer inputs each connected to a corresponding one of the plurality of context parameter register outputs, for selecting a current context parameter set for transmission to a multiplexer output; and

5 a context identification register connected to the context register bank, for storing a current context identification token identifying a current context for the context register bank, wherein

10 the context identification register is connected to a select line of the multiplexer, for controlling the multiplexer to select the current context parameter set for transmission; and

the context identification register is connected to a load enable line of each of the context parameter registers, for enabling an updating of a current context parameter set in a corresponding context parameter register.